# THE EFFECTIVENESS OF SEXUAL ASSAULT NURSE EXAMINER (SANE) PROGRAMS

## A Review of Psychological, Medical, Legal, and Community Outcomes

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*In sexual assault nurse examiner (SANE) programs, specially trained forensic nurses provide 24-hour-a-day, first-response medical care and crisis intervention to rape survivors in either hospitals or clinic settings. This article reviews the empirical literature regarding the effectiveness of SANE programs in five domains: (a) promoting the psychological recovery of survivors, (b) providing comprehensive and consistent postrape medical care (e.g., emergency contraception, sexually transmitted disease [STD] prophylaxis), (c) documenting the forensic evidence of the crime completely and accurately, (d) improving the prosecution of sexual assault cases by providing better forensics and expert testimony, and (e) creating community change by bringing multiple service providers together to provide comprehensive care to rape survivors. Preliminary evidence suggests that SANE programs are effective in all domains, but such conclusions are tentative because most published studies have not included adequate methodological controls to rigorously test the effectiveness of SANE programs. Implications for practice and future research are discussed.*

**Key words:** *rape, sexual assault, sexual assault nurse examiners, forensic nursing*

RAPE SURVIVORS ENCOUNTER significant difficulties seeking help from their communities after an assault.[1] Fewer than half of rape victims treated in hospital emergency departments (EDs) receive basic services, such as information about the risk of pregnancy, emergency contraception to prevent pregnancy, and information on the risk of STDs/HIV. Furthermore, most rape cases are not prosecuted by the criminal justice system. During the past three decades, victim advocates have developed local, state, and national reforms to try to address these problems (see Martin, 2005, for a review). For example, many hospitals will now allow advocates to be present with survivors during their ED treatment to provide emotional support and advocate on their behalf for needed medical services. Rape crisis centers have been instrumen-

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### KEY POINTS OF THE RESEARCH REVIEW

- This article reviews the empirical literature regarding the effectiveness of sexual assault nurse examiner (SANE) programs in five domains: psychological recovery, comprehensive medical care, accurate collection and documentation of forensic evidence, improving prosecution, and creating community change.
- Preliminary evidence suggests that SANE programs are effective in all domains.
- Conclusions of this review are tentative because most published studies have not included adequate methodological controls to rigorously test the effectiveness of SANE programs.

tal in creating new policies to standardize forensic evidence collection. Often referred to as "rape kits," these protocols were developed so that all survivors who seek postassault medical care can have the evidence of the crime thoroughly documented. In addition, many states have dramatically reformed their criminal sexual assault laws, dropping antiquated requirements that made prosecution nearly impossible. These reforms have undoubtedly had a profound impact on the lives of countless rape victims, and yet most survivors still do not receive adequate medical care and most rape cases are not prosecuted.

Also, within the past 30 years, another reform effort emerged—this one led by the nursing profession with support and collaboration from rape crisis centers. Concerned about the quality of care that survivors were receiving in hospital EDs, nurses across the country became trained in forensic evidence collection so that they, rather than doctors, could provide postassault medical care. Consistent with the basic tenets of nursing practice, these alternative programs sought to provide health care while also attending to the emotional needs of rape survivors. Sexual assault nurse examiner (SANE) programs were created in communities throughout the United States whereby specially trained forensic nurses would provide 24-hour-a-day, first-response medical care and crisis intervention to rape survivors in either hospitals or clinic settings.[2] With increased attention to collecting forensic evidence with state-of-the-art techniques, many SANEs hoped that the prosecution of rape would increase as well. The first SANE programs emerged in the 1970s, and they expanded rapidly throughout the 1990s. Now numbering nearly 450 programs nationwide (International Association of Forensic Nurses [IAFN], 2005), SANEs offer survivors and their communities an alternative model of care, one that emphasizes comprehensive, multisystem service delivery. Although there are still far more communities without SANE programs and an unknown number of survivors who are still struggling for medical care and legal justice, it is important to examine whether SANE programs have made a positive difference in rape survivors' postassault help-seeking experiences.

**Sexual assault nurse examiner (SANE) programs were created in communities throughout the United States whereby specially trained forensic nurses would provide 24-hour-a-day, first-response medical care and crisis intervention to rape survivors in either hospitals or clinic settings.**

The purpose of this article is to review the literature regarding the effectiveness of SANE programs as a reform effort. The literature on SANE programs is largely descriptive, with numerous articles detailing how SANE programs have been created, what kind of problems they have encountered, and how they have resolved those issues (e.g., Ahrens et al., 2000; Aiken & Speck, 1995; Antognoli-Toland, 1985; Arndt, 1988; Cornell, 1998; Fulginiti et al., 1996; Hatmaker, Pinholster, & Saye, 2002; Ledray, 1992, 1995, 1996; Lenehan, 1991; O'Brien, 1996; Rossman & Dunnuck, 1999). Similarly, there is a substantial body of work on the technical aspects of forensic evidence collection and the administration of SANE programs (e.g., Hohenhaus, 1998; Ledray, 1997a, 1997b, 2000; Ledray & Barry, 1998; Ledray & Netzel, 1997; O'Brien, 1998; Sievers & Stinson, 2002). Other authors have already written syntheses regarding these aspects of SANE programs (Hutson, 2002; Lang, 1999; Ledray, 1999; Littel, 2001). Therefore, the goal of this article is to advance the literature by focusing on the growing empirical literature regarding the effectiveness of SANE programs in

multiple domains. What do we know about the success of these programs?

To set the stage for examining the effectiveness of SANE programs, we will begin by briefly reviewing the research on rape survivors' experiences with hospital EDs to uncover what is problematic about this "old" approach to postassault care and what SANE programs sought to change. Then, we will provide an overview of SANE programs, examining how their current structure, function, and operations attempt to provide a more comprehensive and survivor-centered model of care. With this background, we will then review the empirical literature on the effectiveness of SANE programs in five domains.[3] First, SANE programs strive to create settings that address survivors' emotional needs as well as their health concerns. As such, this article will review the evidence on how SANE programs may help survivors' psychological recovery from the rape. Second, we will examine whether SANE programs provide more consistent and comprehensive medical services than what survivors receive in traditional hospital ED care. Third, another founding goal for many SANE programs was to improve the quality of forensic evidence collection, so the empirical literature on nurses as forensic evidence collection specialists will be reviewed. Fourth, by documenting the physical evidence of sexual assault so carefully, it is possible that SANE programs may increase prosecution rates in their communities, and the few studies that have explicitly tested this hypothesis will be examined. Finally, the creation and maintenance of SANE programs often requires a coordinated community effort between multiple social systems and agencies. As such, the evidence regarding how SANE programs function as catalysts for community change will be examined. This article will conclude by exploring the implications of these findings for practitioners and policy makers as well as outlining recommendations for future research on the effectiveness of SANE programs.

## WHY ARE SANE PROGRAMS NEEDED?

When rape survivors seek help after an assault, they are most likely to be directed to the medical system—specifically, hospital EDs (Resnick et al., 2000). Although most victims are not physically injured to the point of needing emergency health care (Ledray, 1996), survivors are sent to the hospital anyway, primarily for forensic evidence collection (Martin, 2005). The survivor's body is a crime scene and because of the invasive nature of sexual assault, a medical professional, rather than a crime scene technician, is needed to collect the evidence. The "rape exam" or "rape kit" usually involves plucking head and pubic hairs; collecting loose hairs by combing the head and pubis; swabbing the vagina, rectum, and/or mouth to collect semen, blood, or saliva; and obtaining fingernail clippings and scrapings in the event the victim scratched the assailant. Blood samples may also be collected for DNA, toxicology, and ethanol testing. Throughout this process, medical professionals must take extreme care so as not to taint or destroy the evidence (Ledray, 1999).

Martin (2005) noted that many ED physicians are reluctant to do these exams largely because they do not feel that this is a medical procedure that requires their expertise. Instead, they believe that they should be treating other patients with emergent health threats. This reluctance on the part of ED physicians to do rape forensic evidence collection manifests as long wait times for survivors as most spend 4 to 10 hours in the ED before they are examined (Littel, 2001). During this wait, victims are not allowed to eat, drink, or urinate so as not to destroy physical evidence of the assault (Littel, 2001; Taylor, 2002). ED physicians also do not like doing evidence collection because if subpoenaed to testify in court, they would be challenged on their qualifications, training, experience, and ability to conduct the exam (Ledray, 1999; Littel, 2001). Indeed, most ED personnel lack training specifically in forensic evidence collection, and as a result, many rape kits collected by ED doctors are done incorrectly and/or incompletely. Even ED physicians with forensic training usually do not perform forensic exams frequently enough to maintain their proficiency (Littel, 2001).

Forensic evidence collection is often the focus of hospital ED care, but rape survivors have other medical needs such as injury detection and treatment, information about the risk of

pregnancy and emergency contraception to prevent pregnancy, and information on the risk of STDs and prophylaxis. However, numerous studies have found that fewer than half of rape victims treated in hospital EDs receives these basic services. For example, most rape survivors receive a medical exam and forensic evidence collection kit (70% to 81%; Campbell, 2005; Campbell, Wasco, Ahrens, Sefl, & Barnes, 2001). Yet only 40% of the survivors in the National Victim Survey (National Victim Center, 1992) and 49% of the women in Campbell et al.'s (2001) sample of urban rape survivors received information about the risk of pregnancy. With respect to emergency contraception to prevent pregnancy, accounts from victims indicate that 28% to 38% of women receive this service (Campbell, 2005; Campbell et al., 2001), but analyses of hospital records have found lower rates of 20% to 28% (Amey & Bishai, 2002; Rovi & Shimoni, 2002; Uttley & Petraitis, 2000; see also Smugar, Spina, & Mertz, 2000). Approximately one third of rape survivors receive information about the risk of STDs/HIV from the assault, and between 34% and 57% obtain medication to treat STDs (Amey & Bishai, 2002; Campbell, 2005; Campbell et al., 2001; National Victim Center, 1992; Rovi & Shimoni, 2002).

In addition to gaps in service delivery, it appears that rape survivors are often treated insensitively by hospital ED staff. These negative experiences with social system personnel have been termed "the second rape" (Madigan & Gamble, 1991), "the second assault" (Martin & Powell, 1994), or "secondary victimization" (Campbell & Raja, 1999; Williams, 1984). For example, it is not uncommon for hospital ED staff to question victims about their prior sexual histories, what they were wearing at the time of the assault, what they did to "cause" the assault, why they were with the assailant in the first place (if they knew the rapist), and why they trusted the assailant (if they knew the rapist). Medical professionals may view these questions as necessary and appropriate, but rape survivors report that they are very upset and distressed by such questioning. Campbell (2005) found that as a result of their contact with ED doctors and nurses, most rape survivors stated that they felt bad about themselves (81%), guilty (74%), depressed (88%), nervous/anxious (91%), violated (94%), distrustful of others (74%), and reluctant to seek further help (80%) (see also Campbell & Raja, 2005, for replicated rates). Similarly, Campbell et al. (1999) found that victims of non-stranger rape who received minimal medical services but encountered high secondary victimization had significantly elevated levels of posttraumatic stress symptomatology. These rape survivors were doing worse than the victims who did not seek medical services at all. These findings suggest that when victims place their trust in the medical system for help after a rape, they risk the possibility of additional distress.

## THE HISTORY AND CURRENT OPERATIONS OF SANE PROGRAMS

To address these health care gaps for rape victims, the nursing profession created Sexual Assault Nurse Examiner (SANE) programs. These alternative service programs were designed to circumvent many of the problems of traditional hospital ED care by having specially trained nurses, rather than doctors, provide 24-hour-a-day, first-response care to sexual assault victims in either hospital or non-hospital settings. Nurses were also interested in learning the intricacies of forensic evidence collection and expert witness court testimony (Ledray & Arndt, 1994; Littel, 2001). The first SANE programs emerged in the 1970s in Memphis, Tennessee (1976), Minneapolis, Minnesota (1977), and Amarillo, Texas (1978) (Ledray & Arndt, 1994). In 1992, the first international meeting of SANEs was held with representatives from programs across the United States and Canada, and the International Association of Forensic Nurses (IAFN) was formed (Littel, 2001). Forensic nursing was identified as a specialty by the American Nurses Association (ANA) in 1995. Rapid development of SANE programs occurred in the mid-1990s as knowledge about SANE programs spread (Littel, 2001).

Currently there are nearly 450 SANE programs throughout the United States and its territories (IAFN, 2005).[4] Most SANE programs (75% to 90%) are hospital-based (e.g., housed within EDs or clinic settings), but some are lo-

cated in community settings (10% to 25%; e.g., rape crisis centers or medical office buildings; Campbell et al., in press; Ledray, 1997a). Nearly all programs serve adolescents and adults, and approximately half serve pediatric victims as well (IAFN, 2005). SANE programs are staffed by clinicians (usually registered nurses or nurse practitioners) who have typically completed 40 hours of classroom training, which includes instruction in evidence collection techniques and the use of specialized equipment, chain-of-evidence requirements, expert testimony, injury detection and treatment, pregnancy and STDs screening and treatment, rape trauma syndrome, and crisis intervention. An additional 40 to 96 hours of clinical training is also needed (e.g., performing pelvic exams on nonrape survivors, observing SANEs complete exams, courtroom observation), and specialized continuing education is often required by local programs (IAFN, 2005; Ledray, 1997b, 1999).

This extensive training formed the foundation for an alternative model of postassault care. In outlining a national protocol for forensic and medical evaluation of sexual assault victims, Young, Bracken, Goddard, and Matheson (1992) stated, "The broad goals of the national model protocol are to minimize the physical and psychological trauma to the victim and maximize the probability of collection and preserving physical evidence for potential use in the legal system" (p. 878). To address survivors' psychological needs, SANEs strive to preserve victims' dignity, ensure that they are not retraumatized by the exam, and assist them in regaining control by letting them make decisions throughout the evidence-collection process. Many SANE programs work with their local rape crisis centers so that rape victim advocates can also be present for the exam to provide emotional support (Hatmaker et al., 2002; Lang, 1999; Littel, 2001; Rossman & Dunnuck, 1999; Seneski, 1992; Smith, Homseth, Macgregor, & Letourneau, 1998; Taylor, 2002). To attend to survivors' physical health needs, most SANE programs offer emergency contraception for sexual assault victims who are at risk of becoming pregnant and prophylactic antibiotics to treat STDs that may have been contracted in the assault (Lang, 1999; Taylor, 2002). Although the risk of contracting HIV from a rape is typically low (Ledray, 1999), it is a primary concern for most victims. As such, most SANE programs provide victims with information about degree of risk and testing options (Lang, 1999; Ledray, 1999).

With respect to the forensic evidence collection itself, most SANE programs use specialized forensic equipment that is not often used in traditional hospital ED care, such as a colposcope, which allows for the detection of microlacerations, bruises, and other injuries in sexual assault victims (Voelker, 1996). A camera can be attached to the colposcope to photodocument genital injuries (Lang, 1999). Toluidine blue is also used by some SANEs in the detection of genital trauma by enhancing the visualization of microlacerations (Ledray, 1999). The forensic evidence collected by the SANEs is typically sent to the state crime lab for analysis, and the results are forwarded to the prosecutor's office. If a case is prosecuted, the SANE may provide factual or expert witness testimony at the trial (Ledray, 1998; Ledray & Barry, 1998). In factual witness testimony, a SANE provides information as to what exactly occurred in her or his interactions with the victim (e.g., what evidence was collected, what injuries were sustained, etc.). If a SANE is reviewed by the court and deemed to be an expert, she or he can testify not only about evidence collected and the facts of the case but also about opinions and conclusions that can be drawn from evidence.

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Yet when a SANE provides testimony, either factual or expert, "[she] is not an advocate, she is a witness" (Ledray, 1998, p. 287). This raises a potential role conflict for SANEs as they need to care for the psychological well-being of their patients, which may involve advocacy, and yet, from a legal perspective, they need to be unbiased. Although it is possible to provide empathic care and emotional support without "biasing" the

forensic or legal components of the case, in the event a case does go to trial, it is preferable that the SANE not be viewed as a victim advocate (Ledray, 1998, 1999; Ledray & Barry, 1998; Littel, 2001). Consequently, as SANEs have become more involved in court testimony, many programs have revised their policies and procedures to ensure adequate attention to survivors' emotional needs without compromising SANE's credibility as witnesses. For instance, Smith et al. (1998) resolved this role conflict by involving rape crisis center advocates to provide emotional support while the nurses complete the medical-legal examination and maintain the chain of evidence. This "division of labor" was deemed necessary so that the SANEs could be effective, unbiased expert witnesses in court. In addition, rape victim advocates can offer survivors confidentiality, whereas SANEs may have to testify about their communications with victims (Littel, 2001).

SANEs provide extensive psychological, medical, and legal services for rape survivors, but truly comprehensive care involves the efforts of many service providers, including law enforcement personnel, crime lab staff, prosecutors, and rape crisis center staff. As such, many SANE programs today operate as part of multidisciplinary response teams (e.g., Sexual Assault Response Teams [SARTs]) or coordinated community response initiatives (Hutson, 2002; Littel, 2001). Historically, many SANE programs were created by the sole or primary initiative of individual nurses seeking to make change in their communities, but now it is becoming more common that multidisciplinary coordinating committees work together to create SANE programs (Campbell et al., 2005; Hutson, 2002). These steering groups are often charged with creating initial policies and procedures and ensuring cooperation, rather than competition, between agencies (Hutson, 2002). Recognizing the importance of collaboration, three states currently require all SANE programs who apply for state funding to have a multidisciplinary team to oversee the implementation of their SANE program (Littel, 2001). Many SANE programs continue to work closely with the members of the multidisciplinary team after programs have been implemented to review cases and verify that survivors received comprehensive care (Littel, 2001).

## THE EFFECTIVENESS OF SANE PROGRAMS

Because the work of SANE programs is multifaceted, addressing psychological, medical, and legal concerns, defining and measuring "success" or "effectiveness" is complex. For example, some SANE programs have made it a goal to improve prosecution of sexual assault cases in their communities, whereas others have noted that the rape prosecution is influenced by many factors, only one of which is the presence and quality of forensic evidence. Consequently, some programs have not defined success by prosecution rates. Therefore, the evaluation of individual SANE programs must reflect the specific goals and missions of that program, but it may be useful to consider multiple indices of success when evaluating the collective work of SANE programs as a reform effort. In this section of the article, the empirical literature on SANE programs will be examined to evaluate the success of SANE programs in five domains: (a) promoting the psychological recovery of survivors, (b) providing comprehensive and consistent medical care, (c) documenting the forensic evidence of the crime completely and accurately, (d) improving the prosecution of sexual assault cases by providing better forensics and expert testimony, and (e) creating community change by bringing multiple service providers together to provide comprehensive care to rape survivors (see Table 1).

### *Psychological Effectiveness*

Although the forensic aspects of SANEs' work typically receives the most attention by the legal and medical communities, it is the commitment to victims' psychological well-being that defines how SANEs work with their patients throughout all aspects of care. Putting this point in perspective, Ledray, Faugno, and Speck (2001) noted that a SANE is a compassionate and supportive RN who is also a skilled forensic technician. Although emotional care is a primary goal of SANE programs, there have been few studies that have systematically eval-

**TABLE 1: Research Findings on the Effectiveness of Sexual Assault Nurse Examiner (SANE) Programs**

| *Studies* | *Major Findings* |
|---|---|
| Psychological effectiveness | |
| Solola, Scott, Severs, & Howell (1983) | More than 90% of survivors treated in the Memphis SANE program were not experiencing assault-related anxiety. |
| Malloy (1991) | Victims treated in the Minneapolis SANE program identified the nurses listening to them as one thing that helped them the most during their crisis period. |
| Ericksen et al. (2002) | Victims treated at a Canadian SANE program felt respected, safe, in control, believed and supported, cared for by people with expertise, informed, and cared for beyond the hospital because they received the option for follow-up care. |
| Medical/health care effectiveness | |
| Crandall & Helitzer (2003) | STD prophylaxis and emergency contraception were more routinely provided in the SANE program as compared to the traditional hospital ED care. |
| Ciancone, Wilson, Collette, & Gerson (2000) | |
| Derhammer, Lucente, Reed, & Young (2000) | After a SANE program was implemented, victims were significantly more likely to be given a complete physical exam than before the SANE program was created. |
| Forensic effectiveness | |
| Ledray & Simmelink (1997) | SANE-collected kits were more thorough and had fewer errors than the non-SANE kits. |
| Sievers, Murphy, & Miller (2003) | |
| Legal effectiveness | |
| Crandall & Helitzer (2003) | Police filed more charges of sexual assault post-SANE as compared to pre-SANE. The conviction rate for charged SANE cases was also significantly higher, resulting in longer average sentences. |
| Community change effectiveness | |
| Crandall & Helitzer (2003) | The working relationships and communication between medical and legal professionals improved substantially after the implementation of a SANE program. |

uated the psychological impact of SANE programs. In a study of the Memphis SANE program, Solola, Scott, Severs, and Howell (1983) found that 50% of victims in their study were able to return to their usual vocation within 1 month, and in 3 to 6 months, 85% felt secure alone in public areas. After 12 months, more than 90% of the survivors were entirely free of their initial assault-related anxieties and emotional discomposure. Unfortunately, this publication did not provide sufficient details regarding the methodology of this study to assess whether the recovery gains were attributable to the SANE program or to "normal" recovery processes. Other research suggests that, at the very least, rape survivors perceive SANEs as helpful and supportive. In an evaluation of the Minneapolis SANE program, Malloy (1991) surveyed 70 patients in crisis and found that 85% of the survivors identified the nurses listening to them as one thing that helped them the most during their crisis period.

In the most in-depth study on this topic, Ericksen et al. (2002) conducted semistructured qualitative interviews with eight survivors who were treated in a Canadian "specialized sexual assault service," which included both specially trained physicians and SANEs. The primary goal of this study was to understand what it meant to survivors to receive this kind of care. Using latent content analysis, the authors identified nine major themes in the participants' narratives: (a) They felt they were respected as a whole person—their needs were met and they were treated with dignity and respect, (b) they felt the presence of the nursing staff—they provided information about what to expect and listened to the survivors, (c) they felt safe—the caregivers were women and were sensitive in their care, (d) they appreciated how they were physically touched—the nurses held their hands during the exam, (e) they felt in control—they were given options and were not pushed toward certain choices, (f) they felt reassured—

they felt believed and supported by the staff, (g) they felt they were cared for by people with expertise—their care providers knew what they were doing, (h) they felt informed—they were given information and the staff were careful not to overwhelm them with too much information, and (i) they felt cared for beyond the hospital—they received follow-up care or the option for follow-up care. These descriptive data provide insight into how and why SANE programs may be psychologically beneficial to rape survivors, but as the authors of this study also noted, there is a need for larger-scale studies on the short-term and long-term psychological impact of SANE programs on survivors' recoveries.

### *Medical/Health Care Effectiveness*

Many rape survivors treated in hospital EDs do not receive needed medical services, which was another problem that SANE programs sought to address. As with the literature on psychological outcomes, there are few published reports documenting rates of medical service delivery in SANE programs, but available data suggest that victims treated in SANE programs receive consistent and broad-based medical care. In a national survey of SANE program staff, Ciancone, Wilson, Collette, and Gerson (2000) found that 97% of programs reported that they offer pregnancy testing, 97% provide emergency contraception, and 90% give STD prophylaxis. The SANE program staff indicated that services such as conducting STD cultures, HIV testing, toxicology, and ethanol screening are not routinely performed but are selectively offered to survivors.[5] These rates of service delivery are substantially higher than what has been found in studies of traditional ED care (e.g., Amey & Bishai, 2002; Campbell, 2005; Campbell et al., 2001; Rovi & Shimoni, 2002). However, Ciancone et al.'s data were collected from SANE program staff about what they say they provide in their programs rather than from individual survivors regarding the actual services they received. Coming closer to a direct assessment of service delivery, Derhammer, Lucente, Reed, and Young (2000) examined chart records before and after a SANE program was implemented in a hospital ED and discovered that in only 11% of the pre-SANE cases were survivors given a complete physical exam (both external exam and internal vaginal exam). This percentage jumped significantly to 95% after the SANE program was implemented. Unfortunately, this study did not document rate changes for other medical services, such as emergency contraception and STD prophylaxis, pre-SANE to post-SANE.

In the most comprehensive and methodologically rigorous study to date on medical service delivery in SANE programs, Crandall and Helitzer (2003) compared the services received for sexual assault cases seen at the University of New Mexico's Health Sciences Center for the 2 years prior to the inception of a SANE program (1994 to 1996) ($N$ = 242) and 4 years afterward (1996 to 1999) ($N$ = 715). Statistically significant changes in medical services delivery rates were found from pre-SANE to post-SANE. For example, the rate of pre-SANE pregnancy testing in this hospital was 79% and increased to 88% post-SANE. Providing emergency contraception was also more common after the SANE program was created (66% to 87%). STD prophylaxis was also more routinely provided in the SANE program as compared to the traditional hospital ED care (89% to 97%). Given the quasi-experimental design of this study, these increases are likely attributable to the implementation of the SANE program, but it is worth noting that the pre-SANE rates of service provision found at this hospital were already substantially higher than what has been found in prior studies of medical service delivery. For instance, service delivery rates for emergency contraception in hospital EDs are typically 20% to 38%, and at the University of New Mexico's Health Sciences Center, they were 66% before the SANE program even started. Even though this hospital may have already been providing reasonably comprehensive care to rape survivors, their rates of service delivery still significantly increased post-SANE. However, it is not clear whether a SANE program could make such headway in hospitals with lower starting rates of service delivery.

### *Forensic Effectiveness*

SANE programs emerged not only because traditional ED care did not pay adequate attention to survivors' emotional and medical health needs but also because the forensic evidence collection itself needed to be improved. ED physicians receive either no training or only minimal training in forensics, which has raised concern among victim advocates that the evidence of sexual assault is not being adequately documented (Ledray, 1999; Littel, 2001). SANEs sought to address this issue through extensive training and practice in forensic techniques. However, since taking on this new role, SANEs throughout the country have been challenged by both the medical and legal communities as to whether they were qualified and skilled enough to perform this task (DiNitto, Martin, Norton, & Maxwell, 1986; Littel, 2001). The clinical case study literature suggests that SANEs are not only competent in forensic evidence collection, but they are actually better at it because of their extensive training and experience. For example, Cornell (1998) noted that "with the [SANE] program, physicians are removed from the role of witness. Now evidence is collected more consistently and adequately" (p. 46). Similarly, Littel (2001) noted that SANE programs have "greatly improved the quality and consistency of collected evidence" (p. 7). Yet clinical case reports, though remarkably consistent in their conclusions, do not provide definitive evidence of the effectiveness of SANEs in forensic evidence collection. Empirical studies that directly compare the evidence collected by SANEs and physicians on objective criteria would better inform the debate about whether nurses are competent forensic examiners.

To date, there have been only two such comparative studies conducted in the United States. First, Ledray and Simmelink (1997) reported the findings from an audit study of rape kits sent to the Minnesota Bureau of Criminal Apprehension. Twenty-seven kits conducted by SANEs were compared to 73 kits collected by physicians or non-SANEs with respect to completeness of specimens collected, documentation, and maintenance of chain of custody. Overall, the SANE-collected kits were more thorough and had fewer errors than the non-SANE kits. For example, with respect to completeness of evidence, 96% of the SANE kits versus 85% non-SANE kits collected the swabs to match the recorded orifice of penetration, 92% of the SANE kits versus 15% of non-SANE kits contained an extra tube of blood for alcohol and/or drug analysis, and in 100% of the SANE kits versus 81% of non-SANE kits the blood stain card was properly prepared. In addition, the chain of evidence was broken in some non-SANE kits but was always maintained in SANE kits. Although these descriptive data suggest that the SANEs' evidence collection was more thorough and accurate, inferential statistics were not reported so it was not known whether these differences were statistically significant.

A larger scale study by Sievers, Murphy, and Miller (2003) explicitly tested differences between SANE and non-SANE kits and also found support for better evidence collection by SANEs. Specifically, this study compared 279 kits collected by SANEs and 236 by doctors/non-SANEs on 10 quality-control criteria and found that in 9 of 10 ten categories, the SANE-collected kits were significantly better. The kits collected by SANEs were significantly more likely than kits collected by physicians to include the proper sealing and labeling of specimen envelopes, the correct number of swabs and other evidence (pubic hairs and head hairs), the correct kind of blood tubes, a vaginal motility slide, and a completed crime lab form. The Sievers et al. study provides the strongest evidence to date that SANEs collect forensic evidence correctly and, in fact, do so better than physicians. However, it is important to note that training and experience, not job title or professional degree, are the likely reasons behind these findings. Further underscoring the link between experience and evidence quality, DiNitto et al. (1986) reported that prosecutors in Florida were "satisfied with evidence collected by nurse examiners, crediting the training of the nurse examiners. . . . Prosecutors tended to be more pleased with the quality of a physician's evidence *when the examiner had conducted many exams and thus had perfected the techniques*" (p. 539,

emphasis added). Because SANEs have made it a professional priority to obtain extensive forensic training and practice, it is not surprising that both case study and empirical data suggest that they are better forensic examiners than physicians and nurses who have not completed such training.

### *Legal Effectiveness*

SANEs provide law enforcement personnel and prosecutors with detailed forensic evidence documenting crimes of sexual assault, which raises the question: Do SANE programs have an impact on prosecution rates in their communities? As with the literature on the quality of forensic exams, case studies suggest that SANE programs increase prosecution (Aiken & Speck, 1995; Cornell, 1998; Hutson, 2002; Littel, 2001; Seneski, 1992). For example, there are reports that SANE programs specifically increase the rate of plea bargains because when confronted with the detailed forensic evidence collected by the SANEs, assailants will decide to plead guilty (often to a lesser charge) rather than face trial (Aiken & Speck, 1995; Ledray, 1992; Littel, 2001; Seneski, 1992). Other reports indicate that when cases do go to trial, the expert witness testimony provided by SANEs is instrumental in obtaining convictions (O'Brien, 1996; Smith, 1996, as cited in Ledray, 1999).

Yet there have been few studies that have empirically tested the hypothesis that SANE programs increase prosecution. Studies that report the prosecution rates for SANE programs rarely include a comparison group (e.g., rates before and after the SANE program was implemented or comparisons to another community without a SANE program). However, there is already an extensive literature on "typical" rates of prosecution in communities without SANE programs. For example, arrest rates in rape cases have been found to vary between 25% (Frazier & Haney, 1996) to 49% (Spohn & Horney, 1992).[6] Prosecution rates are quite variable, with published findings ranging from 14% (LaFree, 1980) to 35% (Spohn & Horney, 1992) to 56% (Spohn, Beichner, & Davis-Frenzel, 2001). Drawing from these published reports, it can be informative (though not conclusive) to compare arrest and prosecution rates in communities with SANE programs to these figures from communities without SANE programs.

For example, Solola et al. (1983) examined the legal outcomes for 621 victims who were treated in the Memphis SANE program in 1980. Police reports were filed in 573 of these cases (92%), and 124 resulted in an arrest and successful prosecution (22% of reported cases). However, 135 cases were still pending at the time this study was conducted, and if the rates of arrest and prosecution are examined only in closed cases, the prosecution rate was 28%. In either analysis, the prosecution rates of 22% or 28% are still higher than what has been found for non-SANE cases (typically 14% to 18%; some as high as 35% to 56% on average). Similarly, in her case study of the Santa Cruz County SANE program, Arndt (1988) noted that 42% of sexual assaults involving victims 14 years and older resulted in arrests of the perpetrators and 58% of child molestation cases resulted in arrest, which again is higher than what is found for cases that do not involve SANE programs (typically 25% to 44%; some as high as 49% on average). Ledray (1992) reported that of 417 rape cases in Minneapolis in 1990, 193 were presented by police to the county attorney (46%). Of those 193 cases, 60 were not charged by the prosecutor (31%), 65 defendants pleaded guilty (34%), 14 went to trial (7%) (6 found guilty, 8 found not guilty), and the outcomes in the remaining 54 cases were not reported.

As noted previously, a stronger methodological design would include a direct comparison of legal outcomes for SANE cases versus non-SANE cases, and to date, there has been only one such study. Crandall and Helitzer's (2003) comparison of legal outcomes in a New Mexico jurisdiction before and after the implementation of a SANE program found that significantly more victims treated in the SANE program reported to the police than did before the SANE program was launched in this community (72% versus 50%) and significantly more survivors had evidence collection kits taken (88% versus 30%). Police filed more charges of sexual assault post-SANE as compared to pre-SANE (7.0 charges/perpetrator versus 5.4). The conviction rate for charged SANE cases was also signifi-

cantly higher (69% versus 57%), resulting in longer average sentences (5.1 versus 1.2 years). These data provide the strongest evidence yet that SANE programs can have a beneficial impact on the prosecution of sexual assault cases. However, as was noted previously, this New Mexico community may be somewhat atypical in its pre-SANE responses to sexual assault survivors. The pre-SANE conviction rates were substantially higher than published reports and post-SANE numbers were higher still, which raises the question whether such effects are possible in communities with lower starting conviction rates.

### *Community Change Effectiveness*

The effectiveness of SANE programs in multiple domains—psychological, medical, forensic, and legal—suggest that something profoundly different happens when survivors are treated in these alternative programs. SANE programs' successes may be attributable not only to the work of the individual nurses but also to the kind of community-level change that comes about in forming and sustaining a SANE program (Ahrens et al., 2000). As discussed previously, rape survivors need help from multiple service providers and SANE programs provide a structure for comprehensive, integrated care. Some programs may deliberately identify community change as a founding goal and purpose, but others may find that such change happens along the way as part of the process of implementing a SANE program. Indeed, case reports from local SANE programs suggest that these programs increase interagency collaboration and cooperation, which improves care for survivors (Hatmaker et al., 2002; Selig, 2000; Smith et al., 1998).

In the only empirical study of the effectiveness of SANE programs in creating community change, Crandall and Helitzer (2003) interviewed 28 key informants from health care, victim services, law enforcement, and prosecution who had been involved in the care of sexual assault survivors both before and after a SANE program was implemented in their community. The informants stated that before the SANE program, community services were disjointed and fractionalized, but afterward care for survivors was centralized because there was a point of convergence where multiple service providers could come together to help victims. Informants also noted that the SANE program increased the efficiency of law enforcement officers by reducing the amount of time they spent waiting at the medical facility. As a result, officers could spend more time investigating the case. Moreover, the informants believed that police officers were better able to establish positive rapport with survivors, which increased the quality of victim witness statements.

In addition to improving the services provided to survivors, the informants indicated that since the SANE program was implemented, working relationships and communication between medical and legal professionals had improved substantially. For instance, prior to SANE, law enforcement had difficulty communicating with health care providers because their working relationship lacked consistency. The SANE program created standardized response protocols and hosted regular interagency meetings to review cases and engage in ongoing quality improvement. One important benefit of this direct communication was that officers were able to identify more quickly and accurately trends in similar assaults and perpetrator types, which was instrumental in discovering a pattern rapist in their community.

Whereas the collaborative relationship between the medical and legal communities greatly benefited from the emergence of a SANE program in this community, the results were not so clear-cut for the relationship between the SANE program and the local rape crisis center. The advocates interviewed in Crandall and Helitzer's (2003) study had "mixed emotions" about their work with the SANE program. Advocates believed that the SANEs felt that they could do the advocates' job and that services of the advocate were duplicative and unnecessary. Ironically, the advocates felt that before the creation of the SANE program, hospital ED personnel had valued their role, but now the SANEs sometimes acted as though the advocates were in their way. It is interesting to note that the health care informants

had a different perspective. The medical providers stated that before the SANE program, they felt that the advocates were in their way while they were trying to treat victims, but post-SANE they perceived the advocates as helpful and supportive to victims. It is possible that the process of creating the SANE program highlighted the need for multiple service providers to work together to provide care for survivors. Hospital personnel may not have fully appreciated the need for specific attention to survivors' emotional well-being, but with the emergence of the SANE program, this issue was highlighted. However, in this community it appears that the emergence of the SANE program called into question whether rape victim advocates or SANEs should have the primary responsibility for the emotional care of rape survivors. As noted previously, because SANEs may testify in court, their communication with victims is not confidential, but advocates can provide confidential services. This suggests that there is a need for advocates, and they can work together with SANEs to provide an emotionally supportive setting for care. The issue of confidentiality was not examined in Crandall and Helitzer's study, but it is an important factor to consider in future work on the relationship between SANE programs and rape crisis centers.

**From the information that is available, it appears that SANE programs promote the psychological recovery of rape survivors, provide comprehensive medical care, obtain forensic evidence correctly and accurately, and facilitate the prosecution of rape cases.**

## THE FUTURE OF SANE PROGRAMS: IMPLICATIONS FOR PRACTICE, POLICY, AND RESEARCH

The current literature on SANE programs consists primarily of case study reports, with few empirical studies that have tested the effectiveness of SANE programs in multiple domains. Yet from the information that is available, it appears that SANE programs promote the psychological recovery of rape survivors, provide comprehensive medical care, obtain forensic evidence correctly and accurately, and facilitate the prosecution of rape cases. Through this work, SANE programs can be instrumental in creating interagency collaborative relationships that improve the overall community response to rape. However, such conclusions are tentative because most published studies have not included adequate methodological controls or comparisons to rigorously test the effectiveness of SANE programs. Nevertheless, these preliminary findings can be helpful to SANE practitioners and policy makers because they indicate that this approach to treating sexual assault survivors has merit and should continue for further evaluation and analysis.

Specifically, this information may help practitioners with two primary issues: launching new programs and developing "benchmarks" of effectiveness for established programs. First, knowing that SANE programs have the potential to be effective in multiple domains may be instrumental in starting new SANE programs. It is often difficult to obtain broadbased community support for new initiatives because it is not yet known if the effort will be successful. Although the full impact of creating a SANE program in an individual community cannot be known prior to implementation, the literature suggests that many SANE programs have been able to address the psychological, medical, and legal needs of rape survivors. Although policy analysts have noted that empirical research is not always convincing in policy decisions (Weiss, 1983), the fact that there is independent evidence demonstrating promising effects is probably more persuasive than individuals' beliefs that such an effort is worthwhile. Why should a local community launch a new SANE program? Because there is ample evidence that the "old" model of traditional hospital ED care is not only incomplete but also potentially revictimizing, and there is emerging evidence that the "new" model created by SANE programs addresses major gaps in service delivery for sexual assault survivors. However, communities should also consider cost-benefit issues as some hospitals serve very few sexual assault victims, and as such, a designated SANE may not be cost effective for that community.

Second, the literature on SANE programs can also serve as a reference for expected or desired outcomes in established programs. Once a program is launched and the challenges of implementation have been resolved, many community stakeholders will want to know whether the program is effective. As this review illustrated, effectiveness can be defined in multiple ways, and the research findings suggest many possible positive outcomes or benchmarks. If a program discovers, for example, that prosecution rates are not improving in their community, it is helpful to know that the literature suggests other SANE programs have been instrumental in increasing prosecution. This creates an opportunity for professional dialogue to identify what worked in one program and consider how those elements could be successfully transplanted to another program.

Although the current literature on SANE programs can provide practitioners and policy makers with useful information, this review suggests that there is a pressing need for more methodologically rigorous research on the effectiveness of SANE programs. Because most studies are small in scale and have not been replicated, it is important that neither researchers nor practitioners overstate what SANE programs can accomplish. From a methodological perspective, future research on the effectiveness of SANE programs needs to attend to three primary issues. First, larger scale studies are needed whereby the experiences of more survivors in more programs are analyzed. The case study literature on SANE programs contains multiple studies from a small number of programs (e.g., Minneapolis, Memphis). To evaluate the effectiveness of SANE programs as a reform effort, it is necessary to review data from many more programs. Second, most studies in the literature do not include comparison groups, which must be addressed in future research. Comparisons are needed over time (e.g., before and after SANE programs are implemented) as well as between comparable communities with and without SANE programs. Moreover, SANE programs are remarkably diverse (e.g., hospital versus community based), and although there are common elements that define them, unique elements of individual programs need to be compared. Third, longitudinal evaluations are needed that follow survivors through the process of receiving care in a SANE program and then link those experiences to short-term and long-term outcomes.

From a substantive perspective, future research is needed on the underlying processes that contribute to the effectiveness of SANE programs. If future studies can replicate the positive findings in the current literature, it is important to explore the mechanisms leading to those effects. With respect to psychological recovery, it is not yet known how SANE programs contribute to survivors' emotional well-being. Is it that SANE programs do not "re-rape" victims, causing secondary victimization, and hence survivors have less distress? Is it that SANE programs provide coordinated care and referrals to counseling services for survivors? Furthermore, what is the unique positive contribution of the SANE vis-à-vis a rape victim advocate who is also present and attending to the survivors' well-being? These issues of process are equally important when examining prosecution outcomes. For example, if prosecution rates are higher in communities with SANE programs, why is that? Is it because the quality of the evidence is stronger (as is suggested by Sievers et al., 2003) or because the expert testimony of the SANEs is compelling (as is suggested by Ledray & Barry, 1998), or because SANE programs provide survivors with emotional support and resources that are needed to withstand the lengthy process of prosecution (as is suggested by Seneski, 1992)? Or did the SANE program create collaborative networks that finally enabled disparate social systems to work together toward a common outcome? Understanding the mechanisms by which SANE programs are having positive psychological and legal effects is an important next step for the field.

Finally, future research would benefit from stronger collaborations between sexual assault researchers and SANE program practitioners. The work of SANE programs is remarkably complex, and research and evaluation projects would benefit tremendously from the diversity

of perspectives that come from collaborative partnerships. In studying the effectiveness of SANE programs, a research protocol must be sensitive to the safety and confidentiality needs of survivors (see Sullivan & Cain, 2004). Moreover, it is particularly important, for both ethical and methodological reasons, that evaluations of SANE programs do not interfere with the actual provision of services. Researchers and SANE program staff need to work together to address these practical issues. Indeed, Mouradian, Mechanic, and Williams (2001) went further to recommend that researchers and practitioners should work together on all aspects of a research project, from design to dissemination. Collaborative research can be very time-consuming but ultimately can produce methodologically rigorous research that answers important policy questions (Riger, 1999). Not so coincidentally, that is exactly what is needed in future research on the effectiveness of SANE programs.

## IMPLICATIONS FOR PRACTICE, POLICY, AND RESEARCH

- The literature on SANE programs may help practitioners advocate for the development of new SANE programs because there is preliminary "proof" that this alternative model of care reflects a substantial improvement over traditional hospital ED services. The literature on SANE programs provides practitioners with benchmarks for effectiveness and desired outcomes.
- There is a pressing need for more methodologically rigorous research on the effectiveness of SANE programs to make more concrete statements regarding the functioning and impact of SANE programs.
- Future studies need to include comparisons between communities with and without SANE programs and between SANE programs with different structures, functions, and operations.
- Longitudinal evaluations are needed that follow survivors through the process of receiving care in a SANE program to assess both short- and long-term outcomes.
- Future research is needed to understand the underlying processes and mechanisms that contribute to SANE programs having positive psychological and legal effects.
- Collaboration between sexual assault researchers and SANE program practitioners would improve research and evaluation projects by increasing the awareness of and sensitivity to the complexities of SANE programs.

## NOTES

1. Throughout this review, the terms "victim" and "survivor" will be used interchangeably. Some researchers and advocates have called for using the term "survivor" rather than "victim" to emphasize the strength required to recover from rape; others recommend using the term "victim" to refer to those who have been recently assaulted and the term "survivor" to refer to those further along in recovery. In this article, these terms are used interchangeably to reflect both the violent nature of this crime (hence "victim") and the long-term work of recovering from such violence (hence "survivor"). In addition, this review focuses on female survivors of sexual assault. Although epidemiological data suggest that both females and males are raped, females are at substantially higher risk for assault. As a result, most research to date has focused on female rape survivors, so it is not known if the research findings summarized in this article apply to populations of male victims.

2. Some programs use the term "forensic nurse examiner" (FNE) rather than "sexual assault nurse examiners" (SANE). Because most programs use the term "SANE," we will use this terminology throughout this review.

3. The studies included in this review were limited to those that focused exclusively on SANE programs (as opposed to other coordinated care initiatives, such as Sexual Assault Response Teams [SARTs]) and were specific to work of SANEs (as opposed to counselors, advocates, or other staff who worked in or with the SANE program).

4. Although there are nearly 450 SANE programs nationwide, which is a substantial number, it is important to note that there are still far more hospitals that perform rape exams without SANEs.

5. These services are not routinely provided because they raise complicated legal issues for survivors that must be examined and resolved on a case-by-case basis. For example, if a survivor was tested for HIV at the time of the exam and the results were positive, it is possible that she may be required to notify the rapist of her HIV-positive status and may be at risk for being sued by the rapist. Many SANE programs have decided to discuss the implications of these kinds of services with survivors and allow victims to decide if and how they wish to proceed.

6. Spohn and Horney (1992) examined rape arrest and prosecution rates in six jurisdictions and found widely varying figures. The rate of 49% reflects the average arrest rate across the six cities.

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